

Medical Force Protection: Guyana

Medical Force Protection countermeasures required before, during, and after deployment to Ecuador are as follows:

Major Threats

Diarrheal disease, viral hepatitis A, typhoid and paratyphoid fever, malaria, dengue fever, Venezuelan Equine Encephalitis, leishmaniasis, sexually transmitted diseases, rabies (primarily from stray dogs), heat injury, industrial pollution, and altitude sickness (central region).

Presume local water sources are not safe for drinking.

Requirements before Deployment

1. **Before Deploying report to Medical to:**
 - a. Ensure your Immunizations are up to date, specific immunizations needed for area: **Hepatitis A, MMR, Typhoid, Yellow fever, Tetanus (Td), and Influenza.**
 - b. If you have not been immunized against Hepatitis A (two dose series over 6 months) get an injection of Immunoglobulin with the initial Hepatitis A dose.
2. **Malaria Chemoprophylaxis:** . Risk in all areas of the interior. Sporadic cases have also been reported along the coastal region. Therefore, chemoprophylaxis is recommended. Drug resistance to Chloroquine also exists.
Recommended regimen: Mefloquine 250mg per week begun 2 weeks prior to entering country and continued weekly until 4 weeks after return from country.
Personnel in flight status: Doxycycline 100mg per day begun 2 days before entering country. Continue daily while in country and until 28 days after return.
Terminal prophylaxis (for both chemoprophylaxis regimens): **Primaquine 15 mg per day** for 14 days starting on day of departure from country of risk. **G6PD status must be determined prior to starting Primaquine.**
3. **Get HIV testing if not done in the past 12 months.**
4. **Complete attached Pre-Deployment Screening form and turn into your Medical Section.**
5. **Make sure you have or are issued from unit supply: DEET, permethrin, bednets/poles, sunscreen and lip balm. Treat utility uniform and bednet with permethrin.**

Requirements during Deployment

1. Consume food, water, and ice only from US-approved sources; **"Boil it, cook it, peel it, or forget it".**
2. Involve preventive medicine personnel with troop campsite selection.
3. Practice good personal hygiene, hand-washing, and waste disposal.
4. Avoid sexual contact. If sexually active, use condoms.
5. Use DEET and other personal protective measures against insects and other arthropod-borne diseases. Personal protective measures include but are not limited to proper wear of uniform, use of bed nets, and daily "buddy checks" in tick and mite infested areas.
6. Continue malaria chemoprophylaxis.
7. Minimize non-battle injuries by ensuring safety measures are followed. Precautions include hearing and eye protection, enough water consumption, suitable work/rest cycles, and acclimatization to environment and stress management.
8. Eliminate food/waste sources that attract pests in living areas.
9. Avoid contact with animals and hazardous plants.
10. Consider **Acetazolamide (Diamox) 250 mg every 6 – 12 hours** for 1 – 2 days before ascent and continued for 48 hours **if traveling to elevations >2,500 meters .**

Requirements after Deployment

1. Continue malaria chemoprophylaxis.
2. Begin terminal malaria prophylaxis as described above.
3. Receive preventive medicine debriefing after deployment.
4. Seek medical care immediately if ill, especially with fever.
5. Get HIV and PPD testing as required by your medical department or Task Force Surgeon.

GUYANA
VECTOR RISK ASSESSMENT PROFILE
(VECTRAP)

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1. **GEOGRAPHY:** **Area** of 215,000 sq. km (83,000 sq. mi.), or about the size of Idaho. **Cities - Capital** is Georgetown; **other cities** - Linden and New Amsterdam. **Terrain** - Coastal plain, inland highlands, rain forest, savanna. **Climate** - Tropical.

2. **VECTOR-BORNE DISEASES:**

a. **Malaria** is the main vector-borne disease in Guyana. Year-round risk for all areas under 900 meters elevation inland from the coastal plain; risk greatest in the northwest. Seasonal risk in the coastal plain including the outskirts of Georgetown, with increased risk associated with the rainy seasons (May through mid-August, and November through January). Highly endemic; officially reported (and likely underestimated) annual case totals increased from about 3,000 cases during 1984 to nearly 35,500 (4.5 per 1,000 population) during 1988, and the disease had spread to regions formerly considered risk-free. Incidence decreased during 1989, reportedly because of intensified control efforts, but rebounded to 1988 levels during 1990. Much of the increase during the late 1980s was due to increased incidence of falciparum malaria. Vivax malaria had predominated prior to 1985, but *Plasmodium falciparum* now accounts for more than 70 percent of reported cases, with *P. vivax* accounting for nearly all the remainder. An occasional case caused by *P. malariae* occurs. Chloroquine-resistant *Plasmodium falciparum* is present countrywide. The risk of acquiring malaria is considered high without the proper chemoprophylaxis and would result in a serious loss of combat effectiveness. CRPF exists in the area in Letham (Rupunini District) in the western part of the country.

b. **Dengue** and **Yellow fever** are present at low levels of endemicity. During early 1990, cases of dengue fever (virus serotype unspecified, but dengue 1, 2, and 4 all have been reported from the general region) were reported, apparently representing a spill over from an outbreak in neighboring Venezuela. Some risk of further outbreaks exists because *Aedes aegypti* is present and often abundant. Dengue is more prevalent in coastal areas, while yellow fever is found predominantly along the Brazilian border. The risk of acquiring Yellow fever is low. However, the potential for a major dengue fever outbreak is increasing. Once acquired, dengue or yellow fever would seriously reduce combat effectiveness.

c. **Viral Encephalitis:** Vectored by several species of mosquitoes, these zoonotic agents usually circulate erratically with only occasional incidental human infections. **Eastern, Western and Venezuelan equine encephalitis** reportedly occur, but no outbreaks have been reported. At least 11 cases of "viral encephalitis" were reported during 1988, but apparently were not confirmed as arboviral etiologies. Based on serological data, several mosquito-borne viral agents associated with human illness likely occur. These include **Mayaro** (causes an illness easily mistaken for dengue fever), **Caraparu**, **Mucambu**, and **Oriboca** viruses. The risk of acquiring one of these diseases is considered low. Viral Encephalitis would significantly reduce combat effectiveness.

d. **Leishmaniasis:** Most cases are acquired in the interior forests and savannah areas. Outbreaks of cutaneous leishmaniasis (commonly referred to as "bush yaws") have occurred among military personnel, with most cases attributed to *Leishmania guyanensis*, a member of the *L. braziliensis* complex.

The zoonotic reservoir for this complex includes both ground level (rodents) and arboreal (edentates and marsupials) components. Some cases of mucocutaneous leishmaniasis also have been reported.

3. DISEASE VECTOR INFORMATION:

- a. The mosquitoes, *Anopheles darlingi* and *An. aquasalis*, are the vectors of malaria.
- b. The mosquito, *Aedes aegypti*, is the vector of Dengue Fever and Yellow Fever.
- c. The principal vectors for Viral Encephalitis are *Culex* spp. mosquitoes.

NOTE: *Aedes aegypti* and *Culex pipiens* are reported to be resistant to the insecticide DDT. *Aedes aegypti* is also reported to be resistant to Lindane, Dieldrin, and synthetic pyrethroids.

- d. The reduviid bug, *Rhodnius prolixus*, is the principal vector of **Chagas' Disease**.
- e. The vectors for **Onchocerciasis** are black flies of the genus *Simulium*.
- f. Sand flies, *Lutzomyia* spp., are the main vectors for Leishmaniasis. Most sand flies are active between dusk and dawn and have very limited flight ranges. Potential vector species include *Lu. anduzei*, *Lu. umbratilis* (readily attracted to artificial light sources) and *Lu. whitmani*.
- g. The main vectors for **Endemic Typhus** are the fleas, *Pulex irritans* and *Xenopsylla cheopis*.

4. DISEASE AND VECTOR CONTROL PROGRAMS:

a. Prevention & Control:

Malaria chemoprophylaxis should be mandatory. Consult the Navy Environmental Preventive Medicine Unit #2 in Norfolk, VA (COMM: 804-444-7671; DSN: 564-7671; FAX: 804-444-1191; PLAD: NAVENPVNTMEDU TWO NORFOLK VA) for the current recommendations for chemoprophylaxis.

b. Yellow fever immunizations should be current.

c. The conscientious use of personal protective measures will help to reduce the risk of many vector-borne diseases. The most important personal protection measures include the use of DEET insect repellent on exposed skin, wearing permethrin-treated uniforms, and wearing these uniforms properly. The use of DEET 33% lotion (2 oz. tubes: NSN 6840-01-284-3982) during daylight and evening/night hours is recommended for protection against a variety of arthropods including mosquitoes, sand flies, other biting flies, fleas, ticks and mites. Uniforms should be treated with 0.5% permethrin aerosol clothing repellent (NSN 6840-01-278-1336), per label instructions. NOTE: This spray is only to be applied to trousers and blouse, not to socks, undergarments or covers. Reducing exposed skin (e.g., rolling shirt sleeves down, buttoning collar of blouse, blousing trousers) will provide fewer opportunities for blood-feeding insects and other arthropods. Additional protection from mosquitoes and other biting flies can be accomplished by the use of screened eating and sleeping quarters, and by limiting the amount of outside activity during the evening/night hours when possible. Bednets (insect bar [netting]: NSN 7210-00-266-9736) may be treated with permethrin for additional protection.

d. The most important element of an *Aedes aegypti* control program is SOURCE REDUCTION. Eliminating or covering all water holding containers in areas close to human habitation will greatly reduce *A. aegypti* populations. Alternatively, containers may be emptied of water at least once a week to interrupt mosquito breeding. Sand or mortar can be used to fill tree holes and rock holes near encampments.

e. Because the breeding habitats of most sand fly species are not easily identified, not easily accessible, or unknown, control strategies focus mainly on adult sand flies. Peridomestic sand fly species can be controlled by spraying residual insecticides on buildings (including screening on portals of entry) animal shelters, and other adult resting sites. Area chemical control of sylvan sand fly species is impractical. Personal protective measures will reduce sand fly bites and environmental modification (e.g., clearing forests, eliminating rodent burrows/breeding sites, relocating domestic animals away from human dwellings) has been used to reduce local sand fly populations.

f. Expanded Vector Control Recommendations are available upon request.

5. IMPORTANT REFERENCES:

Contingency Pest Management Pocket Guide - Fourth Edition. Technical Information Memorandum (TIM) 24. Available from the Defense Pest Management Information Analysis Center (DPMIAC) (DSN: 295-7479 COMM: (301) 295-7479). Best source for information on vector control equipment, supplies, and use in contingency situations.

Control of Communicable Diseases Manual - Sixteenth Edition. 1995. Edited by A. S. Benenson. Available to government agencies through the Government Printing Office. Published by the American Public Health Association. Excellent source of information on communicable diseases.

Medical Environmental Disease Intelligence and Countermeasures - (MEDIC). September 1997. Available on CD-ROM from Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004. A comprehensive medical intelligence product that includes portions of the references listed above and a wealth of additional preventive medicine information.

Internet Sites- Additional information regarding the current status of vector-borne diseases in this and other countries may be found by subscribing to various medical information sites on the internet. At the Centers of Disease Control and Prevention home page subscriptions can be made to the Morbidity and Mortality Weekly Report(MMWR)and the Journal of Emerging Infectious Diseases. The address is www.cdc.gov. The World Health Organization Weekly Epidemiology Report (WHO-WER) can be subscribed to at www.who.int/wer. The web site for PROMED is www.promedmail.org:8080/promed/promed.folder.home.

Although PROMED is not peer reviewed, it is timely and contains potentially useful information. The CDC and WHO reports are peer reviewed. Information on venomous arthropods such as scorpions and spiders as well as snakes, fish and other land animals can be found at the International Venom and Toxin Database website at www.uq.edu.au/~ddbfr/. Information on anti-venom sources can also be found at that site. Information on Poisonings, Bites and Envenomization as well as poison control resources can be found at www.invivo.net/bg/poison2.html.